## IN THE CLAIMS

1. (Original) A semiconductor wafer support assembly comprising:

a ceramic puck having a support surface;

a composite cooling plate structure low temperature brazed to a bottom surface of the ceramic puck;

a pedestal joining-ring, circumscribing the composite cooling plate structure and attached to the bottom surface of the ceramic puck; and

a pedestal, electron-beam welded to the pedestal joining-ring.

2. (Original) The wafer support assembly of claim 1 wherein a diameter of the composite cooling plate structure is at least equal to a diameter of the support surface of the ceramic puck.

3. (Original) The wafer support assembly of claim 1 wherein the pedestal joining-ring is fabricated from an iron/nickel/cobalt alloy.

4. (Original) The wafer support assembly of claim 1 wherein the pedestal is fabricated from a material selected from the group consisting of stainless steel, aluminum, nickel, and a nickel alloy.

5. (Original) The wafer support assembly of claim 4 wherein the pedestal joining-ring is high temperature brazed to the bottom surface of the ceramic chuck.

6. (Original) The wafer support assembly of claim 4 wherein the composite cooling plate structure is fabricated from a material selected from the group consisting of an Al-Si-SiC composite, a zirconium alloy, aluminum nitride, an iron/nickel/cobalt alloy, a Si-SiC composite, molybdenum, and a molybdenum alloy.

7. (Original) Th wafer support assembly of claim 1 wherein a transition layer is disposed between the bottom surface of the ceramic puck and the composite cooling plate structure.

8. (Original) The wafer support assembly of claim 1 further comprising a gas conduit ring high temperature brazed to the bottom surface of the ceramic puck.

9. (Original) The wafer support assembly of claim 8 further comprising a gas conduit electron-beam welded to the gas conduit ring.

10. (Original) The wafer support assembly of claim 9 wherein the gas conduit ring is fabricated from a material selected from the group consisting of an iron/nickel/cobalt alloy, nickel, molybdenum/iron/nickel/cobalt alloy, and copper.

11. (Original) The wafer support assembly of claim 1 further comprising a gas conduit ring high temperature brazed to a bottom surface of the composite cooling plate structure.

12. (Original) The wafer support assembly of claim 11 further comprising a gas conduit welded to the gas conduit ring.

13. (Original) The wafer support assembly of claim 11 wherein the gas conduit ring is fabricated from a material selected from the group consisting of an iron/nickel/cobalt alloy, nickel, molybdenum/iron/nickel/cobalt alloy, and copper.

14. (Original) The wafer support assembly of claim 1 further comprising a pair of cooling line rings high temperature brazed to a bottom surface of the composite cooling plate structure.

15. (Original) The wafer support assembly of claim 14 furth r comprising a pair of cooling lines respectively welded to the pair of cooling line rings.

16. (Original) The wafer support assembly of claim 14 wherein the pair of cooling line rings is fabricated from a material selected from the group consisting of an iron/nickel/cobalt alloy, nickel, molybdenum/iron/nickel/cobalt alloy, and copper.

17. (Original) A full area temperature controlled semiconductor wafer support assembly comprising:

a ceramic puck having a wafer support surface;

a composite cooling plate structure having a diameter at least equal to the wafer support surface, said composite cooling plate structure low temperature brazed to a bottom surface of the ceramic puck;

a pedestal joining-ring attached to a bottom surface of the composite cooling plate structure; and

a pedestal, electron-beam welded to the pedestal joining-ring.

18. (Original) The wafer support assembly of claim 17 wherein the composite cooling plate structure is fabricated from a material selected from the group consisting of molybdenum, a molybdenum alloy, and aluminum nitride.

19. (Original) The wafer support assembly of claim 18 wherein the pedestal joining-ring is high temperature brazed to the bottom surface of the composite cooling plate structure.

20. (Original) The wafer support assembly of claim 19 wherein the pedestal joining-ring is fabricated from a material selected from the group consisting of an iron/nickel/cobalt alloy, nickel, molybdenum/iron/nickel/cobalt alloy, and copper.

21. (Original) The wafer support assembly of claim 17 wherein the ped stal is fabricated from a metal material selected from the group consisting of stainless steel, aluminum, nickel, and a nickel alloy.

22. (Original) The wafer support assembly of claim 18 wherein a transition layer is disposed between the bottom surface of the ceramic puck and the composite cooling plate structure.

23. (Original) The wafer support assembly of claim 18 further comprising a gas conduit ring high temperature brazed to the composite cooling plate structure.

24. (Original) The wafer support assembly of claim 23 further comprising a gas conduit welded to the gas conduit ring.

25. (Original) The wafer support assembly of claim 23 wherein the gas conduit ring is fabricated from a material selected from the group consisting of an iron/nickel/cobalt alloy, nickel, molybdenum/iron/nickel/cobalt alloy, and copper.

26. (Original) The wafer support assembly of claim 18 further comprising a gas conduit ring high temperature brazed to the bottom surface of the ceramic puck.

27. (Original) The wafer support assembly of claim 26 further comprising a gas conduit welded to the gas conduit ring.

28. (Original) The wafer support assembly of claim 26 wherein the gas conduit ring is fabricated from a material selected from the group consisting of an iron/nickel/cobalt alloy, nickel, molybdenum/iron/nickel/cobalt alloy, and copper.

29. (Original) The wafer support ass mbly of claim 18 further comprising a pair of cooling line rings high temperature brazed to the bottom surface of the composite cooling plate structure.

30. (Original) The wafer support assembly of claim 29 further comprising a pair of cooling lines respectively welded to the pair of cooling line rings.

31. (Original) The wafer support assembly of claim 29 wherein the pair of cooling line rings is fabricated from a material selected from the group consisting of an iron/nickel/cobalt alloy, nickel, molybdenum/iron/nickel/cobalt alloy, and copper.

32. (Original) The wafer support assembly of claim 17 wherein the composite cooling plate structure is fabricated from a metal matrix composite Al-Si-SiC.

33. (Original) The wafer support assembly of claim 32 wherein the pedestal is fabricated from a metal material selected from the group consisting of stainless steel, aluminum, nickel, and a nickel alloy.

34. (Original) The wafer support assembly of claim 33 wherein the pedestal joining-ring is low temperature brazed to the bottom surface of the composite cooling plate structure.

35. (Original) The wafer support assembly of claim 33, wherein the composite cooling plate structure further comprises a cooling channel.

36. (Original) The wafer support assembly of claim 35 wherein a pair of cooling line rings is low temperature brazed to a bottom surface of the composite cooling plate structure and communicates with said cooling channel.

37. (Original) The wafer support ass mbly of claim 36 furth r comprising a pair f cooling lines respectively welded to the pair of cooling line rings.

38. (Original) The wafer support assembly of claim 33, wherein a gas conduit ring is low temperature brazed to a bottom surface of the composite cooling plate structure.

39. (Original) The wafer support assembly of claim 38 further comprising a gas conduit welded to the gas conduit ring.

40. (Original) The wafer support assembly of claim 33 further comprising a metallization layer disposed on the bottom surface of said ceramic puck.

41. (Original) The wafer support assembly of claim 40 wherein the composite cooling plate structure further comprises a transition layer disposed between the bottom surface of the ceramic puck and the composite cooling plate structure.

42. (Original) The wafer support assembly of claim 32 wherein the composite cooling plate structure further comprises a ratio of composite materials that match a thermal expansion coefficient for an iron/nickel/cobalt alloy at 600°C.

43. (Original) The wafer support assembly of claim 32, wherein the transition layer has a thermal expansion coefficient value in a range intermediate of respective thermal expansion coefficient values of said ceramic puck and said composite cooling plate structure.

44. (Original) A method of assembling a full area temperature controlled wafer support assembly including a puck having a support surface, wherein a diameter of a composite cooling plate structure is at least equal to a diameter of the support surface of the puck, comprising the steps of:

low temperature brazing the puck to the composite cooling plate structure; and

el ctron-beam welding th composite cooling plate structure to a pedestal.

45. (Original) The method of claim 44 further comprising the step of fabricating the puck from a material selected from the group consisting of aluminum nitride, silicon dioxide, silicon nitride, and alumina.

46. (Original) The method of claim 45, further comprising the step of fabricating the composite cooling plate structure from a material selected from the group consisting of zirconium, a zirconium alloy, and an iron/nickel/cobalt alloy.

47. (Original) The method of claim 46 further comprising the step of depositing a metallization layer on a bottom surface of said puck.

48. (Original) The method of claim 46 further comprising the step of disposing a transition layer, having a diameter approximately equal to the support surface diameter of the ceramic puck and the composite cooling plate structure diameter, between said puck and composite cooling plate structure.

49. (Original) The method of claim 48 further comprising the step of selecting the transition layer with thermal expansion coefficient value in a range that is intermediate, with respect to thermal expansion coefficient values of the puck and the composite cooling plate structure.

50. (Original) The method of claim 48 further comprising the step of fabricating the transition layer from a metal matrix composite Al-Si-SiC.

51. (Original) The method of claim 50 wherein the step of fabricating the metal matrix composite further comprises the step of selecting a ratio of aluminum to silicon to define the thermal expansion coefficient of the transition layer.

52. (Original) Th m thod of claim 51 wherein the step of selecting a ratio further comprises the step of selecting 30% Al-Si and 70% SiC.

53. (Original) A method of assembling a full area temperature controlled wafer support assembly, said assembly including a ceramic puck having a support surface, and a molybdenum-containing or aluminum nitride composite cooling plate structure having a diameter at least equal to a diameter of the support surface of the ceramic puck, comprising the steps of:

disposing a gas conduit ring, a pair of cooling line rings, and a pedestal joining-ring on a bottom surface of the composite cooling plate structure;

high temperature brazing the gas conduit ring, the pair of cooling line rings, and the pedestal joining-ring to the bottom surface of the composite cooling plate structure; and

low temperature brazing a bottom surface of the ceramic puck to the composite cooling plate structure.

54. (Original) The method of claim 53 further comprising, prior to the low temperature brazing step, the steps of:

welding a gas conduit to the gas conduit ring; and

welding a pair of cooling lines to the pair of cooling line rings.

55. (Original) The method of claim 54 further comprising the step of electron-beam welding a pedestal to the pedestal joining-ring.

56. (Original) The method of claim 55 further comprising, prior to the electron-beam welding step, the step of providing electrical connections to the ceramic puck and composite cooling plate structure.

57. (Original) A method of ass mbling a wafer support assembly including a ceramic puck and a composite cooling plate structure, comprising the steps of:

high temperature brazing a gas conduit ring and a pedestal joining-ring on a bottom surface of the ceramic puck; and

low temperature brazing a bottom surface of the ceramic puck to the composite cooling plate structure.

58. (Original) The method of claim 57 wherein the composite cooling plate structure is fabricated from the materials selected from the group consisting of molybdenum, a molybdenum alloy, and aluminum nitride.

59. (Original) The method of claim 58 further comprising the step of high temperature brazing a pair of cooling line rings to a bottom surface of the composite cooling plate structure.

60. (Original) The method of claim 59 further comprising, prior to the low temperature brazing step, the steps of:

welding a gas conduit to the gas conduit ring; and

welding a pair of cooling lines to the pair of cooling line rings.

61. (Original) The method of claim 60 further comprising the step of electron-beam welding the pedestal joining-ring to a pedestal.

62. (Original) The method of claim 61 further comprising, prior to the electron-beam welding step, the step of providing electrical connections to the ceramic puck and composite cooling plate structure.

63. (Original) A method of assembling a wafer support assembly including a ceramic puck and a composite cooling plate structure, comprising the steps of:

disposing a gas conduit ring, a pair of cooling line rings, and a pedestal joining-ring on a bottom surface of th composite cooling plat structure;

disposing a bottom surface of the ceramic puck over the composite cooling plate structure; and

low temperature brazing the gas conduit ring, the pair of cooling line rings, and the pedestal joining-ring to the bottom surface of the composite cooling plate structure, and the bottom surface of the ceramic puck to the composite cooling plate structure.

64. (Original) The method of claim 63 wherein the composite cooling plate structure is fabricated from a metal matrix composite material Al-Si-SiC.

65. (Original) The method of claim 64 further comprising, prior to the low temperature brazing step, the steps of:

welding a gas conduit to the gas conduit ring; and

welding a pair of cooling lines to the pair of cooling line rings.

66. (Original) The method of claim 65 further comprising the step of electron-beam welding a pedestal to the pedestal joining-ring.

67. (Original) The method of claim 66 further comprising, prior to the electron-beam welding step, the step of providing electrical connections to the ceramic puck and composite cooling plate structure.

68. (New) The method of claim 44, wherein the composite cooling plate structure further comprises:

a pedestal joining ring coupled to the puck and electron-beam welded to the pedestal.

68. (New) The method of claim 68 further comprising:

brazing the pedestal joining ring to the puck.